

# PATENT COOPERATION TREATY

## PCT

### INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)



REC'D 03 DEC 2003

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Applicant's or agent's file reference B.10346(B.A9724)	<b>FOR FURTHER ACTION</b> See Notification of Transmittal of International Preliminary Examination Report (Form PCT/PEA/416)	
International application No. PCT/EP02/14469	International filing date (day/month/year) 18.12.2002	Priority date (day/month/year) 08.01.2002
International Patent Classification (IPC) or both national classification and IPC B25G1/01		
Applicant TOP GLASS S.P.A. et al.		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.
2. This REPORT consists of a total of 4 sheets, including this cover sheet.  
  
☒ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).  
  
 These annexes consist of a total of 8 sheets.

3. This report contains indications relating to the following items:
  - I ☒ Basis of the opinion
  - II ☐ Priority
  - III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
  - IV ☐ Lack of unity of invention
  - V ☒ Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
  - VI ☐ Certain documents cited
  - VII ☐ Certain defects in the international application
  - VIII ☐ Certain observations on the international application

Date of submission of the demand  24.07.2003	Date of completion of this report  02.12.2003
Name and mailing address of the international preliminary examining authority:   European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Authorized Officer  Dupuis, J-L  Telephone No. +49 89 2399-2908  

**INTERNATIONAL PRELIMINARY  
EXAMINATION REPORT**

International application No. **PCT/EP02/14469**

**I. Basis of the report**

1. With regard to the **elements** of the international application (*Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17)*):

**Description, Pages**

1, 2, 5-11 as originally filed  
3, 4 received on 20.11.2003 with letter of 18.11.2003

**Claims, Numbers**

1-19 received on 20.11.2003 with letter of 18.11.2003

**Drawings, Sheets**

1/2-2/2 as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).  
☐ the language of publication of the international application (under Rule 48.3(b)).  
☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.  
☐ filed together with the international application in computer readable form.  
☐ furnished subsequently to this Authority in written form.  
☐ furnished subsequently to this Authority in computer readable form.  
☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.  
☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

- ☐ the description, pages:  
☐ the claims, Nos.:  
☐ the drawings, sheets:

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5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)).

*(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)*

6. Additional observations, if necessary:

**V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

**1. Statement**

Novelty (N)	Yes: Claims	1-19
	No: Claims	
Inventive step (IS)	Yes: Claims	1-19
	No: Claims	
Industrial applicability (IA)	Yes: Claims	1-19
	No: Claims	

**2. Citations and explanations**

**see separate sheet**

**INTERNATIONAL PRELIMINARY  
EXAMINATION REPORT - SEPARATE SHEET**

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International application No. PCT/EP02/14469

**Re Item V**

**Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

**Claim 1:**

The subject-matter of claim 1 addresses an element with high mechanical resistance and high vibration absorption. The closest prior art is considered to be represented by US-A-5,588,343 recited in the description.

The subject-matter of claim 1 is distinguished therefrom by the core comprising at least two discrete elongated elements created using pultrusion from the first material and extending along the entire length of said element with high mechanical resistance and in that a bearing made of a second known second material is inserted between said elongated elements.

These distinguishing features enable small displacement ability.

None of the cited references discloses nor renders obvious such additional features.

**Dependent claims 2-8:**

Claims 2-8 are dependent on claim 1 and as such also meet the requirements of the PCT with respect to novelty and inventive step.

**Independent method claim 9:**

For the same reasons, the method according to claim 9 is considered as novel and inventive over the available prior art.

**Dependent claims 10-19:**

Claims 10-19 are dependent on claim 9 and as such also meet the requirements of the PCT with respect to novelty and inventive step.

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ART 24 AEDT

influence the chemical and physical characteristics.

The use of adhesives can be eliminated, but this provokes long preparation times of the mould in which the various components are arranged.

This situation has a considerable influence on production costs, and produces unacceptable quality levels. Therefore the technical objective proposed in this invention is to create an element with very high mechanical resistance, and high vibration absorption, and a method for implementing the same, which eliminate the technical problems encountered in prior art.

Within the context of this technical objective, one of the purposes of this invention is that of creating an element that, as well as producing excellent chemical and physical characteristics, is also able to cushion the vibrations that are generated during use, very efficiently.

Another purpose of the invention is to create an element and a method for producing said element without the need for specialized labour, and that can be manufactured in a short time and using automated production methods.

A further purpose of the invention is that of creating an element that is extremely reliable because of its long-lasting physical and chemical characteristics that can be designed so that it is not subject to degeneration because of the inevitable deterioration of some of its components, such as the adhesive.

The last, but by no means the least purpose of the

invention is that of creating an element and a production method that are basically economical, and that can be performed using a pultrusion method that is basically automatic.

The technical objective, as well as this and other purposes, according to the present invention are attained by providing an element with high mechanical resistance and high vibration absorption, characterized in that it comprises at least one internal core composed of at least one first material with predominantly very high mechanical resistance, combined through chemical bonding only with at least one second material with predominantly very highly elastic characteristics.

The present finding also refers to a method for producing an element with very high mechanical resistance and high vibration absorption levels, characterized in that it consists of the automatic uniting through chemical bonding, of a first material with predominantly very high mechanical resistance, combined with at least one second material with predominantly very highly elastic characteristics, in order to form a core that can be coated with at least one third material.

Moreover, other characteristics of this invention are described in the depending claims.

Further characteristics and advantages of the invention will be more evident from the description of preferred but not limiting embodiment of the element with high mechanical

CLAIMS

1. Element with high mechanical resistance and high vibration absorption, characterized in that it comprises at least one internal core composed of at least one first material having predominantly high mechanical characteristics, united simply through chemical bonding, to at least a second material with predominantly highly elastic characteristics.
2. Element according to claim 1, characterized in that said first and second materials are bonded without the use of adhesives.
3. Element according to one or more of the preceding claims characterized in that said first material is composed of a thermoplastic resin in which a plurality of natural and/or synthetic fibers are sunk.
4. Element according to one or more of the preceding claims characterized in that said synthetic fibers are composed of glass fiber.
5. Element according to one or more of the preceding claims characterized in that said second material is composed of an elastomeric polymer.
6. Element according to one or more of the preceding claims characterized in that said thermoplastic resin is an engineered polyurethane thermoplastic polymer, industrially recognised under the name ETPU (engineering thermoplastic polyurethane)
7. Element according to one or more of the preceding claims characterized in that said second material is composed of

thermoplastic polyurethane.

8. Element according to one or more of the preceding claims characterized in that the core is covered with a layer in a third material composed of an elastomeric polymer.

9. Element according to one or more of the preceding claims characterized in that said core comprises at least two elongated elements created using pultrusion.

10. Element according to one or more of the preceding claims characterized in that said elongated elements are rod-shaped or disk-shaped.

11. Element according to one or more of the preceding claims characterized in that a bearing made of said second material is inserted between said elongated elements.

12. Element according to one or more of the preceding claims characterized in that said rod-shaped elements have at least one flat surface and one curved surface, said bearing being inserted between said flat surfaces of said adjacent rod-shaped elements.

13. Method for implementing an element with high mechanical resistance and high vibration absorption, characterized in that it comprises the automatic union through chemical bonding of a first material having predominantly high mechanical characteristics, with at least a second material having predominantly highly elastic characteristics, in order to form a core to be coated with at least one third material.

14. Method according to the preceding claim characterized in fact that the union between the first and second material



occurs without the use of an adhesive, but with the application of heat at an established temperature.

15. Method according to one or more of the preceding claims characterized in that said first material is composed of a thermoplastic resin in which a plurality of natural and/or synthetic fibers are sunk.

16. Method according to one or more of the preceding claims characterized in that said synthetic fibers are composed of glass fiber.

17. Method according to one or more of the preceding claims characterized in that said second material is composed of thermoplastic polyurethane.

18. Method according to one or more of the preceding claims characterized in that said thermoplastic resin is an engineered polyurethane thermoplastic polymer, industrially recognised under the name ETPU (engineering thermoplastic polyurethane)

19. Method according to one or more of the preceding claims characterized in that second material is composed of an elastomeric polymer, preferably of polyurethane type.

20. Method according to one or more of the preceding claims characterized in that said third material is composed of an elastomeric polymer.

21. Method according to one or more of the preceding claims characterized in that said method includes at least one stage in which said first material is obtained through pultrusion.

22. Method according to one or more of the preceding claims

characterized in that method includes at least one coextrusion stage at an established temperature to unite said first material with said second material.

23. Method according to one or more of the preceding claims characterized in that said method includes a thermoforming stage to model said third material into an ergonomical shape.

24. Element with high mechanical resistance and high vibration absorption and the method for implementing the same, as described, claimed and represented in the enclosed drawing tables.